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DRAINAGE IN PERITONEAL SURGERY.*

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In answer to the invitation to discuss drainage in abdominal and vaginal section, I will briefly give the impressions I have gained from personal experience.

Drainage in peritoneal surgery is for the purpose of removing from the peritoneal cavity or neighboring wounded tissues irritating or septic matter that has been introduced at the time of the operation or that finds lodgment there subsequently. When it is possible to prevent the introduction or accumulation of such matter, drainage is of course unnecessary. When such prevention is impossible, it becomes a question of judgment as to whether the irritating or septic matter will in a given case cause only slight symptoms or give rise to serious consequences.

There is danger in leaving irritating matter, such as bloody effusion from raw surfaces, and there is sometimes danger in draining. When the nursing after the operation is not absolutely reliable, most surgeons would prefer to allow the peritonæum to take care of a moderate amount of effusion. When good nursing and personal supervision follow the operation, drainage is preferable if there is any doubt as to the ability of the peritonæum to absorb the fluid. When extensive oozing surfaces are left, and septic germs can not with certainty be excluded or removed, the surgeon who does not drain assumes a great responsibility.

The chief hindrance to a just appreciation of drainage is the fact that either the appropriate and best methods are not always employed or understood, or else not properly carried out.

In the first place, the drainage must be adequate. It must afford a ready exit to the offending material.

In the second place, it must include means for the prevention of infection by way of the drainage-tube or material.

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In abdominal operations it is not always sufficient to drain the *cul-de-sac* of Douglas or the lumbar regions. It must be determined where the effusion will accumulate, and the tube or gauze must reach these places. In one case I used three drainage-tubes with success. In others I have used both a drainage-tube and gauze. In nearly all cases I find it advisable to administer salines as soon after the operation as the stomach will tolerate them for the purpose of causing peristalsis, and thus of preventing adhesions of the irritated peritoneal surfaces to each other and to the raw surfaces. In this way pocketing of effusion is prevented, and its flow toward the drainage-tube or material is facilitated.

After transperitoneal nephrectomy, drainage by gauze strips through a puncture in the lumbar region is preferable, although after large tumors the capsule can sometimes be stitched into the abdominal wound and drained, the wound being then extraperitoneal. Transperitoneal tubular drainage has, however, proved practical in my experience. After operations upon the intestines and abdominal viscera, drainage through the abdominal walls must be employed.

After operations upon the pelvic viscera, either abdominal or vaginal drainage may be made use of.

Operations involving trauma high up in the pelvis should ordinarily be drained by the glass tube extending from the lower portion of the incision down to the bottom of the pelvis. If, however, there is excessive oozing, or a large septic surface left in the pelvis, the gauze packing or Mikulicz drain is better, for it acts as a tampon, as a drain, and as an isolator of the infected or inflamed area. The danger of paralysis or obstruction of the intestines from adhesion of the latter about the gauze gives it dangers that do not belong to the tube, and should restrict its use in such cases to those absolutely requiring it.

When pelvic-bound tumors are removed, leaving the bottom of the pelvis almost entirely denuded of peritonæum, drainage into the vagina by means of the gauze tampon is often necessary to keep the intestines out of the wounded area and the fluids from contact with the general peritoneal cavity. A judicious use of vaginal drainage is the enucleation of the worst forms of pelvic-bound tumors, and in papillomatous, tuberculous, and malignant tumors adds greatly to our success in abdominal sections for such conditions, and enables us to operate upon cases that would otherwise be unfit for operation.

It may even become necessary to remove the uterus to facilitate vaginal drainage. When growths of this kind are of moderate size it is sometimes safe to remove the uterus by way of the vagina, enucleate

or disintegrate the tumors through the space thus provided, and then practically shut off the peritoneal cavity from above by the gauze tampon and drain. When vaginal section is performed, either gauze or a rubber tube may be used.

In cases of removal of the uterine appendages through an incision in the posterior vaginal fornix, a short rubber tube, whose lumen is about one third of an inch in diameter, is all that is necessary in most cases. The act of vomiting and other motion of the body force the effused fluid through the tube into the gauze which envelops the external end within the vagina. After thirty-six hours the tube should be drawn out by means of a string previously attached. I have employed this kind of drainage in a large number of such cases with good results.

In quite a proportion of the cases in which drainage is necessary the oozing is so free that a gauze packing is better. This of course makes it necessary to leave quite a large vaginal opening to contract gradually.

When the uterus is removed *per vaginam* the gauze drain is, I think, preferable, and should project only as far as the stumps and oozing surfaces; never up among the intestines.

The second requisite of successful drainage—viz., the prevention of infection—can usually be attained, and when attained, the chief objection to drainage disappears.

The glass tube for abdominal drainage should be too small to admit a lead pencil. When I see some of the drainage-tubes used I am always reminded of stove pipes that are made to let a draught of air through them. Their contents should be drawn every hour or two, never at longer intervals, and this by means of a sucker, not by a swab, as the latter tends to force some of the liquid back into the peritoneal cavity. A strip of gauze should be kept in the tube between the dressings. The tube should be removed in from thirty to forty hours. The wound should not then be closed by a suture, but a narrow strip of gauze should be passed into it through the abdominal walls with a probe and be left for four or five hours. If the tube is slim enough, and the wound has been tightly sewed around it, the parts will come together about the gauze, which dries the surfaces and secures a primary union after its removal. The drainage site should afterward be washed off with a 1-to-2,000 solution of corrosive mercuric chloride twice daily.

When the Mikulicz drain is used, about one quarter or one fifth should be removed each day, and while the strip is being pulled out

all of the blackish bloody fluid that appears at the surface should be soaked off with sterile absorbent cotton. After the tampon is all out a little fresh sterile gauze should be introduced every three or four hours for two or three times to keep the wound dry, provided there is still space for it.

When a large gauze packing is left in the pelvis and brought out from below, it should be removed in a gradual manner. When but little projects into the peritoneal cavity, as is usual after vaginal hysterectomy for carcinoma or small fibroids, it should be left for about four days and then be removed all at once, and be followed in a few hours by mild antiseptic douches.

The vulvar dressings should consist of an abundance of sterilized absorbent material and be changed every three or four hours. All manipulations of tubes or gauze drains should be by sterile hands with sterile materials.

In conclusion, I wish to emphasize the fact that I do not believe in drainage when it can be avoided. At the same time I have no fear of drainage when I have one of my trained nurses to take care of the tube. I should therefore consider myself culpable if I were to add to the dangers of an operation by unduly prolonging it for the checking of moderate oozing. Neither should I feel justified in taking any risk in leaving either blood or material that might be septic without providing for adequate drainage